(19) World Intellectual Property **Organization** International Bureau



(43) International Publication Date 17 February 2005 (17.02.2005)

(10) International Publication Number WO 2005/014538 A1

(51) International Patent Classification7:

C07D 201/16

(21) International Application Number:

PCT/EP2004/008009

(22) International Filing Date:

16 July 2004 (16.07.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 03077338.6

25 July 2003 (25.07.2003)

(71) Applicant (for all designated States except US): DSM IP ASSETS B.V. [NL/NL]; Het Overloon 1, NL-6411 TE Heerlen (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LEMMENS, Joannes, Albertus, Wilhelmus [NL/NL]; Willem II Singel 70, NL-6041 HV Roermond (NL). SMEETS, Theodorus, Maria [NL/DE]; Burgemeester Eussenstraat 6, NL-6181 BP Elsloo (NL). BRANDTS, Paul, Maria [NL/NL]; Vredeslaan 4, NL-6141 BM Limbricht (NL). CEYSSENS, Koen, Harry, Maria [BE/BE]; Zavelstraat, 22, B-3680 Neeroeteren (BE).

- (74) Agent: VERHAEGEN, Ilse, Maria, Michel; DSM Intellectual Property, P.O. Box 9, NL-6160 MA Geleen (NL).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AB, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PII, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR PURIFYING CAPROLACTAM

(57) Abstract: The invention relates to a process for purifying caprolactam, said process comprising (a) subjecting the caprolactam to a hydrogenation by treating the caprolactam with hydrogen in the presence of a heterogeneous nickel containing hydrogenation catalyst, (b) distilling at least a portion of the hydrogenated caprolactam in a distillation column containing nickel in an amount sufficiently low such that $\Delta PAN_{Ni} \le 3$, wherein $\Delta PAN_{Ni} = \Delta PAN - \Delta PAN_{Ni} = O$, $\Delta PAN =$ increase of the PAN number of caprolactam during distilling, $\Delta PAN_{N=0}$ increase of the PAN number of caprolactam during distilling under the same conditions in a distillation column free of nickel. Nickel is removed from the caprolactam solution prior to the distillation step.